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# Developing and Implementing Fleet Safety Interventions to Reduce Harm: Where to From Here?

DAVEY Jeremy<sup>1</sup>, FREEMAN James<sup>1</sup>, WISHART Darren<sup>1</sup> & ROWLAND Bevan<sup>1</sup>

<sup>1</sup>Centre for Accident Research and Road Safety – Queensland (CARRS-Q)  
Queensland University of Technology, Carseldine Campus, Queensland, Australia

**Abstract:** Despite an increasing level of research being directed towards implementing fleet safety interventions, questions remain regarding the most appropriate methods to develop and implement effective driving safety initiatives within large organisations. This paper reviews current vehicle fleet safety research, focusing on the development, application and integration of research based fleet safety programs. The paper also highlights the major factors that influence fleet safety intervention development and implementation e.g., time, management commitment. The importance of undertaking a baseline measurement approach along with, accurately measuring driving behaviour and the corresponding impact of an organisation's safety climate on employees are discussed. Finally, this research paper also outlines the rationale and methodology for the development of behavioural-based fleet safety programs utilising a case study approach. Specific CARRS-Q intervention strategies that aim to target unsafe high risk practices are discussed along with the implementation of a multi-dimensional best practice model to improve fleet safety.

**Keywords:** fleet-safety, interventions, work-related crashes.

## 1 Introduction

Work related crashes are the most common cause of occupational-related death, injury and reduced productivity in the industrialised world<sup>[1]</sup>, and often result in substantial physical, emotional and financial cost to the community. In Australia, recent worker's compensation statistics reveal that work related fatal crashes have comprised around 40% of all crashes over the years 2001-2005<sup>[2]</sup>. In regards to the economic cost, previous estimations have indicated that the total cost of work related road incidents in Australia was in the vicinity of \$1.5 billion<sup>[1]</sup>. More recent evidence has suggested that the average total insurance cost of a fleet incident to organisations and society is approximately \$28,000<sup>[3]</sup>, while the average cost of a fatal crash in the general Australian motoring community is estimated to be \$2 million<sup>[4]</sup>. While there are obvious costs related to work crashes such as vehicle and property repairs, there are also many hidden expenses including third party costs, workers compensation, medical costs, rehabilitation, customer related costs, increased insurance premiums, administrative costs, legal fees and loss of productivity<sup>[5]</sup>. Taken together, it is acknowledged the true figures are currently unclear, and available evidence appears to suggest that the direct cost of work related crashes is only the 'tip of the iceberg'<sup>[6]</sup>. As a result, research highlights work related road safety as an area that requires further attention with a focus on developing research informed interventions aimed at improving road safety outcomes, and in turn, offering huge financial savings to industry and the community<sup>[5,6,7]</sup>.

## 2 Driving Assessment Tools

Given the tremendous burden that road crashes have on the community, researchers are directing their focus towards investigating the attitudes and behaviours of motorists', as well as determining the value of such self-reported data to predict crash involvement. In essence, the aim of such practices is to conduct driving assessments, in an attempt to identify "high risk" practices and drivers, and determine the link between such factors and negative driving outcomes. Such measurement tools include: the Driving Skill Inventory<sup>[8]</sup>, Driver Anger Scale<sup>[9]</sup>, the Manchester Driver Behaviour Questionnaire (DBQ)<sup>[10]</sup>, Driver Attitude Questionnaire (DAQ)<sup>[11]</sup>, and the Safety Climate Questionnaire-MD (SCQ-MD)<sup>[12]</sup>.

In regards to the most prominent driving assessment tools, the DBQ has been extensively utilised within a range of driver safety research areas such as: the genetics of driving behaviour<sup>[13]</sup>, age differences in driving behaviour<sup>[14]</sup>, cross cultural studies<sup>[15]</sup>, and associations with the likelihood of being involved in an accident<sup>[10, 11, 14]</sup>. Such research has predominantly focused on general motorists, which has indicated that speeding violations are one of the most common factors associated with crash involvement<sup>[16]</sup>.

Another driving tool which is beginning to receive increasing attention within the road safety literature is the Driver Attitude Questionnaire<sup>[11]</sup>. Research has begun to utilise the DAQ within a number of different applied settings such as: speed awareness training<sup>[16]</sup>, general driver training programs<sup>[17]</sup>, bicycle interventions<sup>[18]</sup>, as well as fleet programs<sup>[19, 20]</sup>. Preliminary research indicates that the DAQ has the potential to be utilised to investigate motorists' attitudes towards key road safety issues, such as drink driving, risky overtaking, close following and driving above the speed limit, with motorists again generally reporting the most lenient attitudes towards speeding violations<sup>[16, 19, 20]</sup>.

The Safety Climate Questionnaire-Modified for Drivers (SCQ-MD) is also being utilised within road safety arenas, as researchers begin to recognise the importance of an organisation's attitudes towards fleet and road safety issues. In simple terms, "climate" relates to how employees perceive the organisational culture and practice of a company<sup>[21]</sup>, and it is hypothesised that this perception impacts upon the way in which workers ultimately behaviour at work<sup>[22]</sup>. In regards to safety climate, a growing body of research is demonstrating a link between safety culture and a

variety of outcomes, ranging from vehicle crash rates <sup>[23, 24]</sup>, to injury severity <sup>[25]</sup>. For example, a research study investigated the driving behaviours of 323 fleet employees and reported that work pressure and communication were significantly related to driver distraction <sup>[26]</sup>. Also, Newnam, Watson and Murray <sup>[27]</sup> examined the self-reported driving behaviours of fleet drivers and reported that the safety policies and practices within organisations had a direct impact on driving performance. Taken together, research is beginning to suggest that perceptions regarding the safety policies and practices of organisations may have a direct impact on driving outcomes.

#### Application to Fleet Settings

However, despite the prevalence of research currently focusing on identifying the self-reported attitudes and behaviours that influence crash involvement, relatively little research has endeavoured to examine the self-reported driving behaviours of those who drive company sponsored vehicles and/or spend long periods of time behind the wheel <sup>[27, 28, 29, 30]</sup>. The lack of research focus and corresponding assessment tools within the Australian context appears to be a critical oversight as changes in industry/employer accountability, Occupational Health and Safety (OHS) legislation, Workers Compensation legislation, and public liability are requiring industry to develop better benchmarking along with more comprehensive intervention programs related to fleet safety. Currently, fleet organisations cannot effectively assess current risk and thus also cannot target and develop interventions nor evaluate the effectiveness of countermeasures due to the lack of adequate measurement tools. As a result, fleet companies are experiencing difficulties meeting their legislative requirements to reduce risk (OHS) despite compulsory third party insurance companies demanding increasingly better fleet safety environments across organisations.

What is presumed is that drivers of employer owned vehicles who drive for work-related purposes generally engage in a higher prevalence of aberrant driving behaviours such as speeding <sup>[31]</sup>, and are at a greater risk of crash involvement due to their exposure to the driving environment <sup>[27, 29]</sup>. Preliminary evidence suggests that speeding is the most likely illegal behaviour to be reported by fleet drivers <sup>[31, 33]</sup>. However, more recently research has indicated that a range of contemporary issues may also significantly impact upon safety and crash involvement, such as increased work pressure and driving mistakes, as both these factors have been found to be predictive of work-related crashes <sup>[32]</sup>. Additionally, driving fatigue has been associated with crash involvement <sup>[34]</sup>, as has environmental factors such as exposure to the road e.g., numbers of kilometres driven <sup>[32, 34]</sup>. However, further research appears necessary to determine what self-reported measurement tools are most useful within fleet settings as well as what specific attitudinal and behavioural factors predict crash involvement within such settings. Additionally, While it is noted that the following comments can only be considered subjective, the writers believe that a number of on-going issues within fleet settings need to be addressed. In relation to administering tests and generally gathering self-report data, these include:

- The predominant driving assessment tools utilised in research, such as the DBQ, DAQ and Fleet Safety Climate Survey, are not conducive for administration to large scale commercial driving environments due to their length. Fleet managers and fleet drivers are not willing or not able to devote the appropriate period of time necessary to accurately complete these driving assessment tools. As a result, there is a clear need for brief yet psychometrically sound assessment tools to be developed that are specifically tailored to meet the needs of the fleet industry;
- The traditional scales are increasingly becoming antiquated as contemporary issues that influence fleet drivers' performance have not been included in assessment scales (e.g., fatigue, time pressure); and
- There is a lack of modern, easily administered and user friendly measures that can be utilised for diagnostic, evaluative or appraisal purposes that specifically measure the impact of fleet interventions as well as determine the assessment of associated driving risk.

However, in addition to assessing driver's attitudes and behaviours, there appears considerable value in implementing countermeasures to reduce an organisation's risk of employees being involved in vehicle related crashes.

### 3 Fleet-safety Countermeasures

There are a variety of fleet safety initiatives that have been implemented in recent years to reduce the above highlighted costs, although existing initiatives employed by organisations to reduce crashes typically focus on fleet safety policies and procedures, driver training, driver education and incentives <sup>[5, 6, 35]</sup>. In general terms there are two main forms of fleet-safety countermeasures, which are broad-based vs targeted interventions. Broad-based interventions are designed to be implemented on mass throughout an organisation and aim to increase awareness regarding the importance of safe driving practices. This approach is designed to be inexpensive but cater to a wide range of audience targeting general work related road safety issues. Such interventions often involve implementing new policies within an organisation, developing and distributing posters that highlight the dangers associated with specific driving behaviours, attaching stickers to vehicles that highlight the company values good driving, etc. In contrast, targeted interventions are designed to specifically address high risk or salient issues within the organisation, and are designed to be utilised by specific sectors of the work related driving population. Such interventions may include workshops (which can also be considered a broad-based intervention), driving diaries, monitoring the performance of some employees, crash analysis, etc. Despite the importance of these initiatives, there is little systematic research investigating their effectiveness. The following provides a brief review of current countermeasures as well as the development of new fleet safety initiatives.

#### (i) Driver Training

One of the historical approaches to fleet safety focuses on “behind the wheel” driver training and education. Although many of these programs aim to teach road users the skills necessary for the successful operation of a vehicle on our roads, caution needs to be exercised to ensure that the distinction between performance and behaviour is recognised and what road users are capable of doing, and what they actually do, can be quite different. For example, performance levels of road users can often be linked to the skills and demands of certain road situations, whereas road user behaviour is often influenced by cultural, personality, attitudinal and motivational factors <sup>[36]</sup>. This suggests that high levels of skill or proficiency in a task, does not necessarily translate into better behaviour. There is also a common misunderstanding that improving road user skills will automatically improve road user behaviour which in turn is expected to result in improved road safety. Rather, increased skill proficiency needs to be complemented by organisational processes and procedures that support safe driving behaviour. For example, although training may provide the skills and possible awareness to drive safely (e.g., not speed), organisational processes and work tasks may create time pressure demands that compromise safe driving operations.

Another concern is that driver training and education programs involving a strong practical component such as the development of vehicle control skills, may inadvertently create an inflated belief in one’s own driving ability which in turn may lead to an increase in aggressive driving behaviour <sup>[37]</sup>. In order to improve fleet safety, organisations need to adopt a broader perspective and develop initiatives targeted at the underlying cultural issues further influencing fleet safety along with adopting the necessary supportive organisational processes that facilitate safe driving.

In fact, while driver training and education initiatives are believed to be the cornerstone of many organisational fleet approaches, the evidence for their effectiveness is scant <sup>[5]</sup>. Additionally, in regards to incentive programs, Haworth et al’s <sup>[5]</sup> review of the effectiveness of reward programs on safe work related driving revealed that the most effective programs were those where (a) incentives were in proportion to the crash rates, (b) where incentives are based on group contingency and (c) where a large incentive was provided to a small amount of drivers rather than a small incentive to a larger group of drivers. Apart from this, the evidence appears mixed and there needs to be more empirical testing of the impact of these types of initiatives on driver behaviour.

#### (ii) Occupational Health and Safety Legislation

Perhaps the most significant effect upon work related driving has been the increasing focus on the issue from a legal perspective within Australia. Under all Occupational Health and Safety (OHS) acts, employers must ensure safe and healthy workplaces (which include vehicles) and conditions of work (duty of care). In addition, it is the responsibility of the employing organisation to ensure their driving activities do not present a hazard to the community. Recent changes to the road transportation industry laws including the introduction of Chain of Responsibility (COR) are also believed to increasingly impact upon all work related driving in the near future <sup>[6]</sup>. COR laws regard all parties involved in the supply chain equally responsible for the safety of each other and the overall event. In other words, responsibility is shared by all parties including consignors, packers, loaders, receivers and not just drivers and operators of vehicles. While there is a trend toward national standards regarding OHS processes, particularly crash investigation, the responsibility of risk management policy and procedures related to fleet safety currently rests with the organisation in many instances. As a result, the quality and extent of policy and procedure related to work-related road safety between organisations is variable.

#### (iii) Data Collection and Benchmarking: Proactive vs Reactive Responses

Additionally, while many organisations in Australia have commendable work safety policies and procedures, their efforts in relation to fleet safety has been described as reactive rather than proactive, especially in relation to light vehicle fleet safety <sup>[5, 6, 38]</sup>. For example, fleet databases predominantly consist of crash statistics and associated data that are collected after the event, with little data gathered that may indicate what driving behaviours contributed to the crash. Such practices significantly limit an organisation’s ability to understand the factors most likely associated with crash outcomes (or general aberrant driving behaviours) as such data collection initiatives historically fail to capture sufficient detail. However, utilising driving assessment tools such as the DBQ and other measurements provides a proactive organisational perspective of the type of behaviours exhibited by drivers as well as providing the potential to identify the types of behaviours associated with offences and crashes. Importantly, the use of such measures assist in the development of targeted interventions aimed at reducing the likelihood of a crash before the event occurs, rather than on the traditional post hoc basis. In practical terms, the associated findings and further research into fleet drivers has the potential to assist in the development of targeted interventions and strategies aimed at addressing factors contributing to crashes. **Additionally, such data significantly assists with benchmarking which enables organisations to not only evaluate intervention strategies and monitor improvements, but to also provide an opportunity for organisations to determine progress of work related road safety initiatives in comparison to other businesses and business units.**

Currently, government agencies are only beginning to become more active with regard to fleet safety, particularly through Road Safety Committee meetings. As a result, in recent years, government committees have produced reports which have led to the development and introduction of several fleet safety initiatives including the ‘Fleet Safety Manual’ (Federal Office of Road Safety [FORS]), the FleetSafe program in New South Wales and in

Queensland which is known as the Workplace Fleet Safety System (WFSS) <sup>[6]</sup>. The WFSS is a self audit process for organisations operating vehicle fleets in order to improve and maintain fleet safety <sup>[38]</sup>. The self audit package is comprised of seven objectives including: the inclusion of fleet safety policy within overall organisational policy; informed driver selection; effective induction programs; best practice fleet vehicle selection; comprehensive databases for fleet incidents; incentives and disincentives and adequate training and education <sup>[38]</sup>. However similar to above, there have not been any systematic evaluations regarding the efficacy of the program to impact upon road safety outcomes within specific organisations. Taken together, while there is a growing body of literature devoted to the examination of the nature and extent of the fleet safety problem, results are mixed regarding the results of strategies for driver behaviour change in the fleet environment. What has become evident from a range of recent fleet safety research initiatives is that industry current require intervention strategies that are inexpensive, not resource intensive, immediate and easily implemented within the current work-context and business environment.

#### Need for Brief Interventions

An overarching influence on any intervention implemented within fleet settings is the need for such countermeasures to be brief, as historically, fleet managers as well as company drivers have little time to devote to safety initiatives. Given the importance of time management within fleet environments, the current research team recognise there is a clear need for brief interventions that demand little resources and can be completed without intense management supervision. The term, 'brief intervention' is an umbrella term that originated from a family of therapeutic techniques such as Milton Erickson's seminal works on brief therapy. When brief therapy originated, it represented a departure from the traditional worldview of the nature and treatment of psychological problems as it was not aimed at finding a cure for problems but rather trying to identify and mobilise client resources, energy and skills aimed at doing something to change the current status quo <sup>[39]</sup>.

A number of CARRS-Q's current projects involve designing, implementing and evaluating theory-based brief intervention tools that can practically be used in fleet settings to increase road safety and reduce the burden of crashes and injuries. The following section provides a brief review of some current initiatives being implemented within Australia to improve fleet safety and reduce the burden of work-related crashes.

## 4 Current Intervention Projects

### (i) Driving Diary

A current prominent intervention being implemented within a number of organisations is a driving diary, which incorporates a brief intervention technique for fleet settings that aims to increase personal insight and safety through the identification of aberrant driving behaviours. The driving diary is based upon brief intervention techniques used successfully in the health care arena over the last twenty years, and thus the tool aims to reduce engagement in unsafe driving practices. The current version of the driving diary consists of approximately 20 pages of information regarding: (a) the importance of improving road safety and (b) material highlighting the procedures for completing the corresponding driving diary. As highlighted above, the first stage of designing the driving diary involved examining the brief intervention as well as fleet road safety literature, to determine if there were any areas of congruence or similarities between the two fields. After acceptance of the brief intervention driving diary approach, the next step involved transferring the core elements of the intervention across to the fleet driving field. As a result, the first section of the driving diary tool (e.g., 4 pages) outlines the importance of road safety, the responsibility of every road user, and why it should be the concern for employers and employees e.g., obligation and duty of care.

The next section in the driving diary (2 pages) focuses on the "Challenge to Change" and provides reasons for why someone would benefit from taking the time to examine how they perceive their driving behaviour. The section also begins incorporating the concept of "risky driving behaviours" by highlighting a range of such behaviours (e.g., speeding, not wearing a seat belt, drink driving, etc) and asks respondents to start thinking about and identifying their own risky behaviours. The driving diary is currently being trialled with a large sample of fleet drivers in Queensland. Drivers are being asked to keep a driving diary for ten days, noting times and places associated with unsafe driving behaviour. A follow up survey and formative focus groups are underway to determine the relative effectiveness and utility of the intervention in a fleet setting as well as receive feedback regarding its content and perceived feasibility for use in work-related settings. It is anticipated that the intervention will prove to be a time limited, low cost, evidenced-based tool that can influence behavioural change. In addition, it is anticipated the results of this project will add to the body of knowledge regarding fleet safety, particularly the driver behaviour change literature.

### (ii) Driver Behaviour and Education Workshops

Driver behaviour and education workshops are designed to be delivered as a class room based intervention program encouraging participants to examine their own driving behaviour. The workshops consist of 3 highly interactional sessions over a four hour time frame. The workshop commences with putting the risks associated with work related driving in context and examines factors associated with increased crash risk. Participants then work through identifying underlying factors contributing to their own driving behaviour and the information generated is utilised to dispel some of the myths and misconceptions associated with work related driving risk. The workshop concludes with participants working through a series of initiatives and work related road safety

processes designed to facilitate changes in participants' driving behaviour, culminating in a series of tips and strategies to assist participants to commit to safer driving.

(iii) ) Road Safety Awareness Campaign

The Road Safety Awareness Campaign aims to provide road safety information and messages to all organisational staff, particularly work-related drivers. The campaign may utilise a combination of methods including road safety posters, information in the form of work-related road safety hints or tips, easy-read fact sheets, and computer screen messages (i.e. road message at log off or shut down, etc). By using a variety of tools, the Road Safety Awareness Campaign aims to reach as many individuals as possible and encourage staff to drive safely in all circumstances.

(iv) Tool Box Meeting Groups

Tool Box Meetings utilise the train-the-trainer concept, whereby a number of individuals are trained to administer road safety tool box sessions with their teams. One consistent finding in international Fleet Safety research is that the use of small group facilitation, such as tool box talks (small work group/unit discussions) are a successful means of introducing material to employees and have been shown to be significantly related to behaviour change. This approach would support the concept of building credibility of Fleet Safety as a key issue to be considered in every day work situations. Additionally, a consistent finding in workplace behaviour change programs is that gaining line manager/supervisor support and involvement in program implementation is often essential to effective employee workplace behaviour change. Furthermore, it places responsibility for behaviours firmly within the smaller organisational units where it may become part of a self managing strategy. This supervisor or mid management level offers the opportunity to effectively target and deliver programs to personnel. Perhaps more importantly for the long term, they are also essential in developing a corporate culture conducive of Fleet Safety and are essential in embedding the program for future growth within the organisation.

(v) Online Driver Profiling

This initiative provides the work-related driver with a means to self assess his/her own driving knowledge and/or behaviour. The online tool enables easy access to various road safety quizzes and short questionnaires which are designed to encourage participant involvement in his/her own driving safety, acknowledge risks in their own driving, and a mechanism for behaviour change. The constructs measured and operationalised in these survey and feedback process are part of the research evidence based being developed by the CARRSQ Fleet Team examining influence driving behaviour. These constructs include the following:

Fleet Safety Climate- this construct contains a number of subscales relating to safety rules, organisational communication and support, the influence of work related time pressures, the adequacy of an organisation's fleet safety procedures and finally, employees' perceptions of management commitment.

Driver Behaviour- this construct contains items that measure issues relating to driver behaviour through identifying responses to situations categorised as errors, traffic violations, and aggressive violations. This construct has been previously identified to be a good predictor of crash rates.

Driver Attitudes- items in this domain measure driver attitude towards road traffic encounters.

Risk Taking and Sensation Seeking- the constructs of risk taking and sensation seeking have demonstrated links to crash rates. Participants scoring high on these constructs have been linked to being involved in higher crash rates.

Driving Skill- self-reported assessments of a driver's perception of their own skill level.

Future Intentions- this construct assists in developing a measure of a driver's future intentions related to safe or risky driving behaviours.

The survey also contains a number of constructs such as demographics, self reported crash and offence rates, and items reflecting fleet specific issues previously identified in discussions and workshops with customer fleet organisations. These measures can also be used by an organisation for longitudinal driver behaviour benchmarking.

(vi) Targeted Letter

A personal letter can be mailed to identified target groups, outlining the organisation's safety policies, procedures and practices available to support driver safety. These Targeted Letters are good for addressing any identified higher crash risk groups. In addition, CARRS-Q recommends that copies of the letter be included in induction packs for all new employees, particularly young rural males, as research has identified this group as a being at greater risk for both infringements and crashes.

The letter aims to:

- Increase employees' awareness of work-related road safety risk;
- Provide employees with accurate information about work-related road safety;
- Develop positive attitudes towards Fleet Safety, with flow-on effects to the workplace culture.

The development of this intervention was guided by the Transtheoretical Model of Change (TMC). The TMC is based on the premise that, when adopting a new behaviour, individual's progress through stages of change, with each stage requiring a different type of support to assist the individual in the change process. Based on this Model, interventions designed to facilitate safety behaviour will be most effective when they are appropriately targeted to an individual's stage in the change process. Without obtaining information from employees it is difficult to know

at which stage they are currently positioned. However, it is likely that most drivers are probably in the pre-contemplative stage in regards to safe driving behaviour. That is, they probably see no problem with their current driving behaviour and express no intention to change. This letter aims to raise awareness of personnel risk, so as to advance these employees' attitudes to the contemplative stage, in which they are aware of the risks involved in driving for work and are seriously thinking about adopting safer driving strategies to lower their perceived risk.

## 5 Barriers to Implementing Safety Countermeasure

Historically in terms of exploring and implementing fleet safety interventions, industry has often taken a “silver bullet” approach aimed at developing and implementing a single countermeasure or intervention strategy to encompass and address all fleet related road safety issues. This approach is often reactive rather than proactive which aims to only reduce similar incidents but also is aimed at improving behaviour. One shortcoming with a reactive approach is that often times the single implemented countermeasure results in only a short term fix and does not address the underlying contributing behavioural factors relating to the crash. Thus the organisation embarks on a cyclical process similar to a dog chasing its tail and may not demonstrate significant improvement in their fleet safety records over time.

Traditionally, best practice to improving fleet safety has often meant any practice or type of intervention being implemented. This can result in countermeasures and intervention strategies that have not been previously evaluated or without organisations implementing a thorough and empirical evaluation process. Furthermore, the silver bullet approach is no longer used in other areas of road safety, as research would suggest that intervention approaches need to be proactive and multi-dimensional. For instance, strategies and interventions to reduce the incidence of drink driving often involve not only law enforcement and random breath testing, but also incorporate advertising and awareness campaigns, rehabilitation programs, and technological interventions such as alcohol interlock devices. However, the current state of fleet safety has many organisations not addressing the work related road safety issue as comprehensively as other work related safety risk issues within their workplace. For example, organisations often allocate more safety related resources to lower exposure and lower workplace risk processes in contrast to the high exposure and high risk of work related driving.

In attempting to satisfy legislative needs of OHS, organisations will plan the development of work related road safety intervention strategies, although the reality within the majority of organisations is that they often struggle to implement such interventions. The failure to effectively implement fleet safety interventions often stems from a lack of management commitment and support, and general under resourcing. Thus there is an immense discrepancy between what organisations plan to do and what is actually undertaken in addressing work related road safety risks and initiatives.

However, there are a number of additional organisational difficulties that impact upon the successful implementation of fleet-based interventions. Briefly, these include:

- A tendency to focus on asset management rather than on employee safety,
- Fleet safety is rarely considered to be a core business issue,
- There is often a lack of resources allocated to work-related road safety,
- OHS and fleet safety are historically viewed as separate and often competing issues,
- Organisations do not always see an instant monetary return,
- Fleet safety is often overlooked until a crash happens; and
- Organisations rely heavily on inconclusive evidence based on insufficient crash data.

## 6 Factors of Influence in Fleet Driver Behaviour

As highlighted above, a number of factors may influence fleet safety as well as the implementation of effective strategies to reduce the risk of crashes and/or serious harm. While not always possible, a proactive multi-dimensional approach to fleet safety is required to help address the many factors that influence fleet driver behaviour. The following figure provides an indication of the numerous conditions influencing driver behaviour and subsequently fleet driver behaviour <sup>[40]</sup>. Historically, fleet safety initiatives, in part due to fleet safety coming from an asset management perspective, have taken on a “one size fits” all approach. This approach has often been lacking in addressing the varied influences underlying fleet driver behaviour which results in only short term fleet safety improvement.

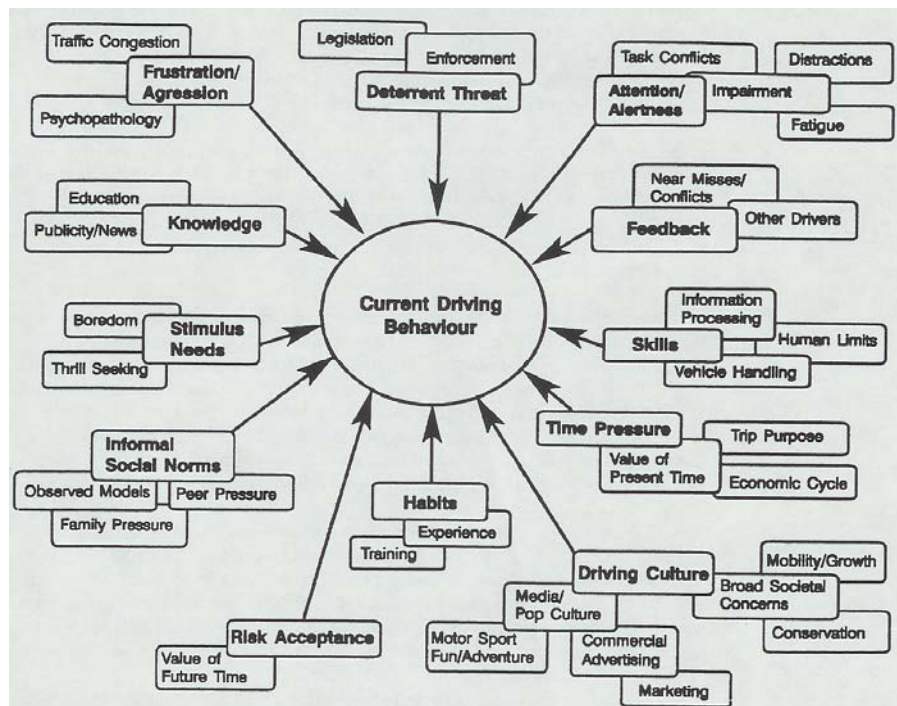


Figure 1. Conditions Influencing Driver Behaviour. Source: Lonero L.P. and Clinton K.M. (1998).

## 7 A Case Study Approach

Research conducted by CARRS-Q with a variety of industry fleets reveal similar patterns emerging across fleets in relation to a range of causal and contributing factors to crashes, data recording and reporting issues, types of crashes, and the types of vehicles involved. Throughout a number of large diverse vehicle fleets, the most common types of crashes accounting for the vast majority of fleet incidents are represented by;

- Reversing
- Rear Enders
- Road Conditions
- Loss of Control
- Animal Related Incidents
- Damage Whilst Parked
- Accumulated Damage

Interestingly, these crash categories appear to be a reflection of a combination of a blameworthy and asset management approach to crashes. However, categorisation in this manner does not provide any insight into the perceptions, attitudes, safety climate and organisational culture contributing to crashes through the influence on human behaviour. In contrast, transport authorities recording of crashes indicate a broader range of contributing factors to crashes which encompasses driver and road conditions. For example, Queensland Transport <sup>[41]</sup> lists factors contributing to crashes such as;

- Disobeying Road Rules
- Alcohol/Drugs
- Speed
- Inexperience
- Inattention
- Age
- Fatigue
- Other Driver Conditions
- Negligence
- Rain/Wet Road
- Road Conditions
- Vehicle Defects
- Street Lighting

These two approaches to recording crashes demonstrate the different genres of approaches to fleet safety within organisations. One being asset management and the second having more of a human behaviour interface. Each method of recording crashes provides different types of information that can be used to inform organisational



objectives and interventions. The asset management approach is the most widely used approach to inform interventions. Whilst this may often result in short term financial gain, it does not supply the information necessary for large scale behavioural interventions and workplace culture change. The alternate approach used in other domains, focuses more on driver behaviour and road conditions.

These two approaches to data collection which inform interventions are reactive in that the core data collection process occurs post crash. What is needed is a data collection approach that centres on driver behaviour and subsequently influences safer work related driving. The majority of current approaches in the workplace while helpful to an organisation in some sense, do not provide the information necessary to implement targeted interventions designed to address the specific behavioural, attitudinal, and cultural influences impacting on work related road safety. In addition, the current reactive data collection approaches also do not provide an effective manner in which to empirically evaluate fleet safety interventions and initiatives that are implemented. For example, the collected data is often more reflective of insurance recording mechanisms which incorporates the process of drivers “attributing blame” elsewhere rather than the objective identification of the factors contributing to the crash.

#### Considering Organisational Culture

In addition to the above, recent research conducted across various vehicle fleet settings suggests there is a strong influence on work related driving behaviours by an organisation’s safety climate<sup>[42]</sup>. Safety climate can be expressed as an employee’s psychological perceptions of safety culture and practice<sup>[43]</sup>. These perceptions are developed from the employee’s continual observation of other work colleagues’ safety practice. These observations in turn influence employee behaviour in relation as to what are considered accepted levels of safety required to perform work related tasks<sup>[44]</sup>.

An example of the influence that organisational culture and safety climate can have on performance can be demonstrated through the practice of speeding. There is a strong focus in road safety and educational campaigns highlighting the dangers of speeding and the need for drivers to obey speed limits yet enforcement data demonstrates that speeding still frequently occurs. Organisational culture within a fleet setting may dictate that it is more important to attend an appointment on time, or complete a “necessary” task urgently, than it is to be late or leave a task incomplete. In this instance the employee may compromise their safety and the safety of others by driving above the speed limit in order to “make up time” or “deliver the goods”.

#### Needs Analysis

Furthermore, organisations embarking on a program of improving fleet safety often undertake a needs analysis investigating what is currently being done in relation to addressing fleet safety issues. This process often involves investigation into areas such as;

- Organisational Process
- Interventions
- Reporting
- Recording
- Policy
- Recruitment
- Interventions
- Evaluation

The results of a needs analysis is then often used by organisations to assist in identifying areas for improvement and to ensure that appropriate processes, mechanisms and structure are adequately in place to support change and intervention strategies. However, the information provided by the needs analysis often exposes deficiencies in processes, reporting, recording, and policy mechanisms without actually informing the design of behavioural based intervention strategies. Future fleet safety research and the subsequent development of intervention programs must address the influences on behaviour to achieve long term improvements in fleet safety. Fleet safety research has previously been lacking in developing research based and informed intervention strategies directed at behaviours, attitudes, intentions, perceptions, organisational culture and safety climate. It is with this in mind that current research should be directed at addressing a number of domains that influence behaviour. The results obtained from baseline measures in these domains should guide the development and implementation of targeted interventions aimed at high risk sectors and behaviours in an operational fleet environment.

#### Identified Baseline Measures

Another proactive step to consider is that organisations need to gather baseline measures from a number of areas that current research has identified as influencing the design, development and implementation of appropriate and targeted intervention strategies. These can include;

- Driver Attitudes
- Road Safety Knowledge
- Behavioural Intentions

- Perceptions
- Risk Taking
- Sensation seeking
- Crash Records
- Driver History
- Safety Climate

Current research undertaken by CARRS-Q is examining the development of targeted intervention strategies tailored toward specific issues identified from baseline measures in the above mentioned areas. The results obtained from these baseline measures are used to assist organisations in making informed choices regarding the implementation of countermeasures. For example, high risk areas of vehicle fleets can be identified from baseline measures not only in terms of vehicle types and geographical location, but also in relation to influences of human behaviour, perceptions, attitudes, personality traits, beliefs, safety climate and organisational culture. Once identified, these high risk sectors assist the design and implementation of appropriate intervention strategies.

As the implementation of intervention strategies and their subsequent results often take time, a further advantage of appropriate baseline measures is that any countermeasures and interventions implemented can be evaluated against changes across a wide variety of performance indicators. For example an intervention strategy may not demonstrate initial improvements in crash rates but may demonstrate improvements in cultural influences of behaviour and attitudes, which in both the short and longer term can lead to improvements in vehicle fleet safety.

## 8 Conclusion

In summary, this paper has highlighted some of the major driving assessment tools, identified factors associated with crashes and general aberrant driving behaviours within organisations, and reviewed some of the major fleet safety countermeasures currently being implemented within Australia. Additionally, the paper has identified some of the major barriers to the effective implementation of fleet safety initiatives and discussed the value of a proactive multi-modal approach to improving safety within organisations. Currently, it appears the future of fleet interventions can continue to be significantly enhanced through embracing multi-modal approaches that utilise a comprehensive baseline benchmarking approach. Such an approach should be based on the utilisation of psychometrically sound measurement scales that have the potential to accurately measure driving behaviour. More specifically, measuring current employee's attitudes and behaviours regarding driving tasks and general safety appears a crucial element for the development and implementation of work-related road safety initiatives. Furthermore, the effectiveness of fleet safety programs are likely to improve through organisations and researchers working collaboratively to ensure that fleet intervention strategies are specifically targeted to meet the needs of organisations, in particular, high risk sectors and/or employees. However, it remains of concern that organisations are reluctant to adequately resource and implement fleet safety interventions that have been tailored to reduce their specific work-related road safety risks. Despite such difficulties, continued efforts to develop, implement and evaluate effective fleet safety interventions can only contribute to the reduction in the burden of work-related road trauma.

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